

A NEUTRON SOURCE FOR ACTIVATION MEASUREMENTS IN A STELLAR SPECTRUM AT $kT=5$ keV

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We report on a measurement of the neutron energy spectrum of the $^{18}\text{O}(\text{p},\text{n})$ reaction at a proton energy of 2582 keV, just 8 keV above threshold. At this energy the resulting spectrum resembles almost perfectly a Maxwellian neutron energy spectrum for a thermal energy of $kT=5.1$ keV. Since the neutrons are emitted in a forward cone of 140° opening angle this neutron source can be ideally used for neutron activation measurements similar to the $^7\text{Li}(\text{p},\text{n})$ reaction which is well established for producing a thermal spectrum at $kT=25$ keV. Measured neutron capture cross sections at $kT=5.1$ keV can be safely extrapolated to $kT=8$ keV which is characteristic for the dominant neutron exposure, producing the main s-process component in thermally pulsing low mass AGB stars. As a first application the Maxwellian averaged capture cross section of ^{138}Ba was measured.